

SCOPE OF CLAIMS

1. A photodiode array comprising a semiconductor substrate,
wherein a plurality of photodiodes are formed in array on an
opposite surface side to an incidence surface of light to be detected, in
the semiconductor substrate, and

wherein a projection having a predetermined height is provided
in a region not corresponding to regions where the photodiodes are
formed, on a side of the incidence surface of the light to be detected, in
the semiconductor substrate.

2. The photodiode array according to Claim 1, wherein a
plurality of depressions having a predetermined depth are formed in
array on the opposite surface side to the incidence surface of the light to
be detected, in the semiconductor substrate, and

wherein each said photodiode is formed in a bottom portion of
the associated depression.

3. The photodiode array according to Claim 1 or 2, wherein
the projection is made of a resin or metal having a light blocking
property.

4. The photodiode array according to any one of Claims 1 to 3,
wherein the projection comprises a plurality of projections, and

wherein the projections are discontinuously arranged at
predetermined intervals.

5. The photodiode array according to any one of Claims 1 to 4,
wherein the semiconductor substrate is provided with an impurity
region between the photodiodes adjacent to each other, for separating
the photodiodes from each other.

6. The photodiode array according to any one of Claims 1 to 5, wherein a high-impurity-concentration layer of the same conductivity type as the semiconductor substrate is formed on the incidence surface side of the light to be detected, in the semiconductor substrate.

5 7. A method of producing a photodiode array, the method comprising:

 a step of preparing a semiconductor substrate comprised of a semiconductor of a first conductivity type;

10 a step of forming a plurality of impurity diffused layers of a second conductivity type on one surface side of the semiconductor substrate to form a plurality of photodiodes each comprised of the impurity diffused layer and the semiconductor substrate, in array; and

15 a step of providing a projection having a predetermined height, in a region not corresponding to regions where the photodiodes are formed, on another surface of the semiconductor substrate.

 8. A method of producing a photodiode array, the method comprising:

 a step of preparing a semiconductor substrate comprised of a semiconductor of a first conductivity type;

20 a step of forming a plurality of depressions in array on one surface side of the semiconductor substrate;

 a step of forming a plurality of impurity diffused layers of a second conductivity type in bottom portions of the depressions to form a plurality of photodiodes each comprised of the impurity diffused layer and the semiconductor substrate, in array; and

25 a step of providing a projection having a predetermined height,

in a region not corresponding to regions where the photodiodes are formed, on another surface of the semiconductor substrate.

9. The method according to Claim 7 or 8, further comprising a step of forming a high-impurity-concentration layer of the first conductivity type on the other surface of the semiconductor substrate,
5 prior to the step of providing the projection.

10. The method according to any one of Claims 7 to 9, further comprising a step of providing an impurity region of the first conductivity type between the impurity diffused layers adjacent to each
10 other.

11. A radiation detector comprising:

the photodiode array as set forth in any one of Claims 1 to 6;
and

a scintillator panel arranged opposite to the incidence surface of
15 the light to be detected, in the photodiode array, and arranged to emit light with incidence of radiation.

12. A radiation detector comprising:

the photodiode array produced by the method as set forth in any one of Claims 7 to 10; and

20 a scintillator panel arranged opposite to the surface where the projection is provided in the photodiode array, and arranged to emit light with incidence of radiation.